Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) Data processing device for performing a reconstruction of coherent-scatter computed tomography (CSCT) data, the data processing device comprising:

a detector comprising both an energy resolving detector element positioned offset from a primary radiation path and a scintillator detector element positioned along the primary radiation path, wherein the energy resolving detector element in configured to acquire a spectrum, and wherein both the energy resolving detector element and the scintillator detector element are formed on the detector;

a memory for storing the CSCT data; and

a data processor for performing a filtered back-projection, wherein the data processor is adapted to perform the following operations:

determining a wave-vector transfer by using the spectrum;

determining a reconstruction volume using the wave-vector transfer and data from the scintillator detector element, wherein a dimension of the reconstruction volume is determined by the wave-vector transfer, wherein the wave vector transfer represents curved

lines in the reconstruction volume; and

performing a filtered back-projection along the curved lines in the reconstruction volume.

2. (Original) The data processing device of claim 1, wherein the spectrum is acquired during a circular acquisition where a source of radiation is rotated around an object of interest in a rotation plane.

3. (Original) The data processing device of claim 2, wherein the reconstruction volume is furthermore determined by two linear independent vectors of the rotation plane.

4. (Previously presented) The data processing device of claim 1, wherein the energy resolving detector is arranged such that it measures a scatter radiation scattered by an object of interest, wherein the CSCT data further comprises information with respect to a primary radiation attenuated by the object of interest, and wherein a preprocessing is performed to correct for an attenuation contribution.

5. (Currently amended) A coherent-scatter computed tomography (CSCT) apparatus for examination of an object of interest, the CSCT apparatus comprising:

a detector unit with an x-ray source;

a scatter radiation detector; and

a scintillator detector, wherein the detector unit is rotatable around a rotational axis extending through an examination area for receiving the object of interest, wherein the x-ray source generates a fan-shaped x-ray beam adapted to penetrate the object of interest in the examination area in a slice plane, wherein the scatter radiation detector is arranged at the detector unit opposite to the x-ray source with an offset with respect to the slice plane in a direction parallel to the rotational axis, wherein the scintillator detector is arranged at the detector unit opposite to the x-ray source in the slice plane, wherein the scatter radiation detector includes a first detector line with a plurality of first detector elements arranged in a line, wherein the plurality of first detector elements are energy-resolving detector elements, wherein both the scatter radiation detector and the scintillator detector are formed on a single detector device;

a data processor configured to perform a filtered back-projection on first readouts of the scatter radiation detector, wherein the data processor is adapted to perform the following operations:

determining a wave-vector transfer by using the first readouts;

determining a reconstruction volume using the wave-vector transfer and data from the scintillator detector, wherein a dimension of the reconstruction volume is determined by the wave-

vector transfer, wherein the wave-vector transfer represents curved lines in the reconstruction volume; and

performing a filtered back-projection along the curved lines in the reconstruction volume.

6. (Previously presented) The CSCT apparatus according to claim 5, wherein the scatter radiation detector is arranged at the detector unit opposite to the x-ray source parallel to the slice plane and out of the slice plane with such an offset along the rotational axis such that the scatter radiation detector is arranged for receiving a scatter radiation scattered from the object of interest, wherein the scintillator detector is configured to receive a primary radiation attenuated by the object of interest, and wherein the data processor is configured to perform a preprocessing to correct for an attenuation contribution by using second readouts of the scintillator detector.

7. (Original) The CSCT apparatus according to claim 5, wherein the reconstruction volume is furthermore determined by two linear independent vectors of the rotation plane and a wave-vector transfer dimension.

8. (Currently amended) Method of performing a reconstruction of coherent-scatter computed tomography (CSCT) data, wherein the CSCT data comprises a spectrum acquired by means of an energy resolving

detector element, the method comprising the acts of:

forming both an energy resolving detector element and a scintillator detector element on a single detector device;

determining a wave-vector transfer by using a spectrum determined using ~~an~~ the energy resolving detector positioned offset from a primary radiation path;

determining a reconstruction volume using the wave-vector transfer and data from ~~a~~ the scintillator detector positioned along the primary radiation path; and

rendering the reconstruction volume, wherein a dimension of the reconstruction volume is determined by the wave-vector transfer, wherein the wave-vector transfer represents curved lines in the reconstruction volume; and

performing a filtered back-projection along the curved lines in the reconstruction volume.

9. (Original) The method of claim 8, wherein the spectrum is acquired during a circular acquisition where a source of radiation is rotated around an object of interest in a rotation plane.

10. (Original) The method of claim 9, wherein the reconstruction volume is furthermore determined by two linear independent vectors of the rotation plane.

11. (Previously presented) The method of claim 8, wherein the

energy resolving detector is arranged such that it measures a scatter radiation scattered by an object of interest, wherein the CSCT data further comprises information with respect to a primary radiation attenuated by the object of interest detected by the scintillator detector, and wherein a preprocessing is performed to correct for an attenuation contribution.

12. (Previously presented) The method of claim 8, further comprising acts of:

energizing an x-ray source such that it generates a fan-shaped x-ray beam which penetrates the object of interest in an examination area in a slice plane;

performing an integral energy measurement of a scatter radiation by means of the energy resolving detector with a first detector line with a plurality of first energy-resolving detector elements arranged in a line;

reading-out the energy measurement from the energy resolving detector; and

rotating the x-ray source and the energy resolving detector around a rotational axis extending through an examination area containing the object of interest.

13. (Currently amended) Computer program stored on a computer readable medium for a data processor for performing a reconstruction of coherent-scatter computed tomography (CSCT) data,

wherein the CSCT data comprises a spectrum acquired by means of an energy resolving detector element positioned offset from a primary radiation path, wherein the computer program causes the data processor to perform the following operations:

determining a wave-vector transfer by using the spectrum;

determining a reconstruction volume using the wave-vector transfer and data from a scintillator detector formed as a single detector device along with the energy resolving detector element, wherein the scintillator detector is positioned along the primary radiation path, wherein a dimension of the reconstruction volume is determined by the wave-vector transfer, wherein the wave-vector transfer represents curved lines in the reconstruction volume;

performing a filtered back-projection along the curved lines in the reconstruction volume; and

outputting the reconstruction volume.

14. (New) The data processing device of claim 1, wherein the energy resolving detector element comprises a plurality of energy resolving detector elements, wherein the scintillator element is sandwiched between the plurality of energy resolving detector elements.

15. (New) The CSCT apparatus according to claim 5, wherein the scatter radiation detector comprises a plurality of scatter radiation detector elements wherein the scintillator detector is

sandwiched between the plurality of scatter radiation detector elements.

16. (New) The method of claim 8, wherein the act of forming both the energy resolving detector element and the scintillator detector element comprise an act of forming the scintillator element sandwiched between a plurality of energy resolving detector elements.

17. (New) The computer program of claim 13, wherein the energy resolving detector element comprises a plurality of energy resolving detector elements, wherein the operation of determining the reconstruction volume using the wave-vector transfer and data from the scintillator detector is performed utilizing the scintillator element sandwiched between the plurality of energy resolving detector elements.